

REMARKS

In the Office Action claims 4, 5, 7, 8 and 10 are rejected as being anticipated by U.S. Patent 4,852,527 Beardmore et al. Claims 6 and 9 are rejected as being unpatentable over Beardmore '527 in view of legal precedent. Reconsideration is requested.

Claim 4 calls for a "trapping lobe projecting a low height from the base circle of the cam configured to provide an associated intake valve with only a small lift during a portion of an exhaust event in an engine cycle". Furthermore, Claim 4 calls for "the dwell portion... projecting slightly beyond the base circle a minimum height to maintain the associated intake valve nearly closed during the dwell portion prior to the end of the exhaust cycle". Accordingly, the trapping lobe provides an associated valve with a small lift and the dwell portion positions the associated valve in a nearly closed position between the small lift, provided by the trapping lobe, and the maximum lift provided by the main lobe.

It is clear that Beardmore fails to teach or suggest the cam profile of claim 4. Instead, Beardmore uses a unique cam profile having a preopening bluff ramp 36, a constant cam velocity opening ramp 38 and a conventional valve lift curve 39. (see column 3, lines 62-65) The "preopening bluff 36 is dimensioned to quickly compress the valve train to a level of force immediately below that required to open the valve, after which the slow opening ramp 38 initiates valve opening." (see column 4, lines 11-15) Thus, the bluff ramp 36 of Beardmore does not actually open the valve but only compresses the valve train. This does not teach or suggest a trapping lobe for providing an associated valve with a small lift during a portion of an exhaust event as claim 4 requires. In addition, the constant cam velocity opening ramp 38 of Beardmore initiates valve opening. This does not teach or suggest a dwell portion providing a minimum valve height to maintain the associated valve nearly closed as claim 4 requires. Accordingly, Beardmore fails to teach or suggest using a trapping lobe or a dwell portion as claim 4 requires.

In sum, Beardmore does not provide either an anticipation or any teaching that would make the claimed arrangement of applicant's invention obvious in view of this prior art. Therefore, claim 4 is believed allowable and the rejection should be withdrawn.

Claims 5-9, being dependent upon claim 4, are also believed allowable for this reason as well as for their additional recitations.

Claim 6 being dependant on claim 4 calls for the trapping lobe having an angular extent from 30 degrees to 100 degrees to provide an associated intake valve with only a small lift during a portion of an exhaust event. This would not have been obvious to one having ordinary skill in the art at the time the Beardmore's invention was made given that Beardmore is directed to a method of reducing valve train noise by quickly compressing a valve train to a level of force immediately below that required to open the valve and then softly opening the valve at a very low initial velocity. Since the bluff ramp 36 only compresses the valve train, increasing the angular extent of the bluff ramp from 30 degrees to 100 degrees would not provide a small lift as the trapping lobe requires. Since Beardmore teaches away from the applicant's claimed invention, the arrangement of claim 6 would only have been obvious with the teaching of the applicant's claimed invention.


Claim 9 being dependant on claim 4 calls for the trapping lobe having a height above the base circle ranging from 10 percent to 40 percent of the height of the main lobe to provide an associated intake valve with only a small lift during a portion of an exhaust event. This would not have been obvious to one having ordinary skill in the art at the time the Beardmore invention was made given that Beardmore is directed to a method of reducing valve train noise by quickly compressing a valve train to a level of force immediately below that required to open the valve and then softly opening the valve at a very low initial velocity. Accordingly, increasing the size of the bluff ramp to 10 to 40 percent of the main lobe would defeat the purpose of Beardmore's claimed invention by opening the valve instead of merely compressing the valve train to a level of force

immediately below that required to open the valve. The arrangement of claim 9 would only have been obvious with the teaching of the applicant's claimed invention.

For the foregoing reasons, the rejections of claims 4-10 are considered unsupported by the references and should be withdrawn. Such action should place this case in condition for allowance and is respectfully requested.

This amendment is believed to be fully responsive to the issues raised in the Office Action and to place this case in condition for allowance. Favorable action is requested.

Respectfully submitted,

By 
Robert J Outland, Attorney
Reg. No. 22,197
(313) 885-1500